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What is Claimed:

- 1                   1.       A data communication method for use in a wireless network having  
2   an access point, the method comprising the steps of:  
  
3                   determining a level for each of a plurality of wireless devices of the wireless  
4   network with respect to the access point;  
  
5                   determining for each of the plurality of wireless devices neighboring ones of  
6   the plurality of wireless devices having adjacent levels; and  
  
7                   transferring data messages between one of the plurality of wireless devices  
8   and the access point sequentially by level through at least one other one of the plurality of  
9   wireless devices.
- 1                   2.       The method of claim 1, wherein the level determining step comprises  
2   at least the steps of:  
  
3                   at each wireless device in the wireless network,  
  
4                   sending a broadcast message;  
  
5                   receiving broadcast messages from neighboring ones of the plurality of  
6   wireless devices, the broadcast messages indicating a neighbor level for each of the  
7   neighboring wireless devices; and  
  
8                   determining the level for the wireless device responsive to the neighbor  
9   levels.
- 1                   3.       The method of claim 2, wherein the step of determining the level for the  
2   wireless device responsive to the neighbor levels comprises:  
  
3                   building a neighbor status database including the neighboring levels from  
4   the received broadcast messages;

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5 identifying the neighboring level having a lowest initialized value; and

6 assigning a level one greater than the neighboring level having the lowest  
7 initialized value.

1 4. The method of claim 3, further comprising the step of:

2 maintaining the neighboring status database in a data link layer.

1 5. The method of claim 1, further comprising the step of:

2 updating the level for each of the plurality wireless devices at a predefined  
3 interval.

1 6. The method of claim 1, wherein the transferring data messages step  
2 comprises at least the step of:

3 forwarding messages through the at least one other one of the plurality of  
4 wireless devices in a data link layer.

1 7. The method of claim 1, wherein the data message includes a original  
2 source address, an immediate transmitter address, and an immediate recipient address,  
3 and wherein the transferring data messages step for communication from the one of the  
4 plurality of wireless devices to the access point comprises at least the steps of:

5 (a) processing the data message for transmission from the one of the  
6 plurality of wireless devices to the access point, the one of the plurality of wireless devices  
7 populating the original source address and the immediate transmitter address with a  
8 source address corresponding to the one of the plurality of wireless device and the  
9 immediate recipient address with an upstream neighbor address corresponding to an  
10 immediate upstream neighboring wireless device;

11 (b) transmitting the data message to the immediate recipient address;

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12 (c) receiving the data message at the immediate upstream neighboring  
13 wireless device corresponding to the immediate recipient address;

14 (d) storing the original source address and the immediate transmitter  
15 address of the data message in a down stream processing table associated with the  
16 immediate upstream neighboring wireless device; and

17 (e) processing the data message for transmission to an other immediate  
18 upstream neighboring wireless device having a lower adjacent level than the immediate  
19 upstream neighboring wireless device, wherein the immediate transmitter address is  
20 updated to match the address of the immediate upstream neighboring wireless device and  
21 the immediate recipient address is updated to match the address of the other immediate  
22 upstream neighboring wireless device.

1 8. The method of claim 7, further comprising the steps of:

2 repeating step (b) through step (e) until the data message reaches the  
3 access point.

1 9. The method of claim 7, wherein the transferring data messages step  
2 for communications from the access point to the one of the plurality of wireless devices  
3 comprises at least the steps of:

4 (f) processing the data message for transmission from the access point to  
5 one of the plurality of wireless devices, the access point populating the final recipient  
6 address with a final destination address corresponding to the one of the plurality of  
7 wireless devices, wherein initially, the access point is an immediate downstream  
8 transmitter wireless device;

9 (g) transmitting the data message from the immediate downstream  
10 transmitter wireless device;

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11 (h) receiving the data message at immediate down stream neighboring  
12 wireless device(s), each immediate down stream neighboring wireless device having an  
13 associated down stream process table; and

14 (i) processing the data message for transmission from the immediate down  
15 stream neighboring wireless device(s) if the final recipient address is located in the down  
16 stream processing table associated with the immediate down stream neighboring wireless  
17 device(s), wherein the immediate down stream neighboring wireless device(s) becomes  
18 the immediate down stream transmitting device.

1 10. The method of claim 9, wherein the transferring data messages step  
2 for communications from the access point to the one of the plurality of wireless devices  
3 further comprises at least the step of:

4 repeating step (f) through step (i) until the immediate down stream  
5 neighboring wireless device is the one of the plurality of wireless devices.

1 11. A method for use in a wireless network including a plurality of  
2 wireless devices to determine a level for each wireless device with respect to an access  
3 point, the method comprising the steps of:

4 at each wireless device in the wireless network,

5 sending a broadcast message;

6 receiving broadcast messages from neighboring ones of the plurality of  
7 wireless devices, the broadcast messages indicating a neighbor level for each of the  
8 neighboring wireless devices; and

9 determining the level for the wireless devices responsive to the neighbor  
10 levels.

1 12. The method of claim 11, wherein the step of determining the level for  
2 the wireless devices responsive to the neighbor levels comprises:

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3 building a neighbor status database including the neighboring levels from  
4 the received responses;

5 identifying the neighboring level having a lowest initialized value; and

6 assigning a level one greater than the neighboring level having the lowest  
7 initialized value.

1 13. The method of claim 12, further comprising the step of:

2 maintaining the neighboring status database as a data link layer database.

1 14. A wireless device for use in a wireless network including a plurality of  
2 wireless devices and an access point, the wireless devices capable of determining a level  
3 with respect to the access point, the wireless device comprising:

4 a transceiver that sends a broadcast message and receives broadcast  
5 messages from neighboring ones of the plurality of wireless devices, the broadcast  
6 messages indicating a neighbor level for each of the neighboring wireless devices; and

7 a controller coupled to the transceiver that generates the broadcast message  
8 and determines the level of the wireless device responsive to the neighbor levels.

1 15. The wireless device of claim 14, wherein the controller determines  
2 the level of the wireless device by building a neighbor status database including the  
3 neighboring levels from the received broadcast messages, identifying the neighboring level  
4 having a lowest initialized value, and assigning a level one greater than the neighboring  
5 level having the lowest initialized value.

1 16. The wireless device of claim 14, further comprising:

2 a memory coupled to the controller that stores information relating to  
3 neighboring ones of the plurality of wireless devices in levels adjacent the determined level  
4 of the wireless device.

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1                   17.    A data communication system for use in a wireless network having an  
2   access point, the system comprising:

3                   means for determining a level for each of a plurality of wireless devices of  
4   the wireless network with respect to the access point;

5                   means for determining, for each of the plurality of wireless devices,  
6   neighboring ones of the plurality of wireless devices having adjacent levels; and

7                   means for transferring data messages between one of the plurality of  
8   wireless devices and the access point sequentially by level through at least one other one  
9   of the plurality of wireless devices.

1                   18.    The system of claim 17, wherein the means for transferring data  
2   messages comprises:

3                   means for forwarding messages through the least one other of the plurality  
4   of wireless devices in a data link layer.

1                   19.    A computer readable carrier including software that is configured to  
2   control a general purpose computer to implement a method for use by a wireless device  
3   within a wireless network having an access point and a plurality of wireless devices to  
4   determine a level for the wireless device with respect to the access point, the method  
5   comprising the steps of:

6                   sending a broadcast message;

7                   receiving broadcast messages from neighboring ones of the plurality of  
8   wireless devices, the broadcast messages indicating a neighbor level for each of the  
9   neighboring wireless devices; and

10                  determining the level for the wireless device responsive to the neighbor  
11   levels.

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1                   20.    The computer readable carrier of claim 19, wherein the software that  
2    is configured to control the general purpose computer to determine the level for the  
3    wireless device comprises software for:

4                   building a neighbor status database including the neighboring levels from  
5    the received broadcast messages;

6                   identifying the neighboring level having a lowest initialized value; and

7                   assigning a level one greater than the neighboring level having the lowest  
8    initialized value.